## THE EFFECT OF RAIN/SNOW DISCRIMINATION METHOD ON RIVER DISCHARGE ESTIMATION DURING WINTER

Yoshihiro ASAOKA<sup>1</sup>, Yasuhi TOYODA<sup>2</sup> and So KAZAMA<sup>1</sup>

<sup>1</sup>Graduate School of Engineering, Tohoku University <sup>2</sup>Central Research Institute of Electric Power Industry

This paper examines the effect of the precipitation form (rain or snow) discrimination method on river discharge estimation during winter. We incorporated two types of discrimination methods into distributed runoff model; one estimates the melting water content with the melting theory of snow particles in the atmosphere and the other distinguishes rainfall or snowfall from precipitation based on air temperature. As a result, there was a notable difference of the short-term runoff during high humidity and precipitation events. In this case, temperature discrimination method underestimates the peak discharge by 45% of the estimation by melting theory method for 28mm daily precipitation. Moreover, the result from sensitive analysis indicates that the method by melting theory is useful for the precipitation in the range of 0 to 2°C and over the 80% relative humidity. The important point of this study is that the discrimination method taking into account not only temperature but also vapor information is ability to prevent the underestimation of river discharge due to rain and

## snowmelt flood

Table 1. Outline of run-off simulation.

		Rain/snow discrimination	Temperature lapse ratio.
	Case1	Estimating water content of snowfall with melting process	Derived from observation
	Case2	Estimating water content of snowfall with melting process	0.006°C/m
	Case3	Rain: more than 2degree, Snow: less than 2 degree	Derived from observation
	Case4	Rain: more than 2degree, Snow: less than 2 degree	0.006°C/m

Figure 1. Result of Run-off simulation



Keywords: Precipitation form, Melting process of snow particles, River discharge estimation, Snowmelt ,Distributed runoff model, Temperature lapse ratio